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(54) Ag ALLOY FILM FOR ELECTRONIC PARTS AND SPUTTERING TARGET MATERIAL FOR FORMING Ag ALLOY FILM

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a Ag alloy film for electronic parts, which has a low electroresistance, high reflectivity improved hillock resistance, heat resistance, corrosion resistance and adhesion to a substrate and to provide a sputtering target material for forming the Ag alloy film.
SOLUTION: The Ag alloy film for the electronic parts includes one or more elements selected among Sc, Y, Sm, Eu, Tb, Dy, Er, or Yb, of 0.1-2 atom.% in total, further one or two elements from Cu and Au, of 0.1-3 atom.%, and the balance substantially Ag. The Ag alloy film among the above films for the electronic parts, includes 0.1-2 atom.% Cu selected from the above Cu and Au. Alternatively, the Ag alloy film for the electronic parts includes 0.1-3 atom.% Au selected from the above Cu and Au. The sputtering targets for forming the Ag alloy film for the electronic parts has the same compositions as the above films.

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention, for example A liquid crystal display (following, LCD), a plasma display panel. (The following, PDP), a field emission display (following, FED), plane display devices (a flat PANERUDE spray.), such as an electrophoresis type display used for electroluminescence (following, EL), electronic paper, etc. In [in addition to FPD] thin film electronic components, such as various semiconductor devices, a thin film sensor, and a magnetic head, In addition to low electrical resistance or high optical reflectance, it is related with the Ag alloy film for electronic parts and the sputtering target material for Ag alloy film formation of which corrosion resistance, heat resistance, and adhesion are required.
[0002]
[Description of the Prior Art]FPD(s), such as LCD and PDP which create a thin film device on a glass substrate, and ****EL**********, Pure metal films or those alloy films, such as a pure Cr film which is metal which is excellent in corrosion resistance, heat resistance, and adhesion with a substrate from the former, a pure Ta film, and an unalloyed ti film, are used for the electric wiring film used for the magnetic head etc. which form an element on a thin film sensor and a ceramic substrate, and the electrode. In recent years, the above metal membranes for thin film devices require the low resistance metal membrane. In particular, in the field of FPD, although the thin film transistor (TFT) method in which enlargement, highly-minute-izing, and a high speed response are possible is adopted widely, the wiring film has the demand of low-resistance-izing, in order to prevent signal delay. For example, in the wiring used for large-sized color LCD of 12 inches or more used for a notebook computer etc., specific resistance below in 30microomegacm. With 10 or less microomegacm, and a future liquid crystal television and Personal Digital Assistant as which a high definition is required more, the further low resistance metal membrane is demanded of 15-inch still more large-sized desktop PCs.

[0003]For this reason, the aluminum alloy which added Ti, Ta, Nd, etc. to aluminum which is low resistance further is used more for these wiring films from the alloy of Cr excellent in corrosion resistance or adhesion, or Ta ** Mo of low resistance, the alloy film of W, and now.
[0004]Generating also has few hillocks by heating of the process at the time of especially an aluminum-Nd alloy being excellent in corrosion resistance, heat resistance, and adhesion, and manufacturing a thin film device, It is known that it is a metal membrane which has the characteristic where specific resistance can be decreased to about 5 microomegacm by performing heat-treatment at not less than 250 **, etc. with 15microomegacm although it is high, and which was excellent where membranes are furthermore formed on the substrate of a room temperature.
[0005]In addition, the metal membrane formed with the aluminum alloy has the feature that the reflectance of a light region is very high. Therefore, although the reflective liquid crystal display which uses outdoor daylight efficiently in recent years, and does not use a back light fundamentally in LCD which is the representation of FPD, the transflective type liquid crystal display which combined the transmission type and the reflection type further, etc. are developed, It has been mostly used also to the reflection film used for such a reflection type display.
[0006]However, even if it is the metal membrane formed with the aluminum alloy, it cannot be said that it is enough in order to realize, improvement in the high speed response nature corresponding to the further highly-minute-izing demanded on a future large sized display, the display for portable devices, etc., and an animation, and. In addition, heat-treatment is required to obtain a low resistance wiring film with an aluminum alloy like previous statement, and since sufficient heat-treatment cannot be performed when a resin substrate, a resin film, etc. are used, the fault of being difficult to get also has low resistance. Therefore, it changes to an aluminum alloy and application of Ag which is low resistance further is considered. Ag is superior to aluminum also in reflectance. In recent years, the liquid crystal display is asked for the flat reflection property in the high reflection and light region which are called a paper white to a reflection film for low power consumption and display upgrading, and application of Ag which is excellent in reflectance also in the use of a reflection film is considered.
[0007]
[Problem(s) to be Solved by the Invention]Although a reflection film and specific resistance have the characteristic better than aluminum and an aluminum alloy, the metal membrane formed by Ag as mentioned above has the low adhesion over a substrate, and has generating of the hillock resulting from stress, and the fault that heat resistance and corrosion resistance are still lower. For example, when Ag is used as the wiring film or reflection film of FPD, membranous adhesion produces the problem that it is low and peeling arises in a process, to the glass which is a substrate, a resin substrate and a resin film, and a corrosion-resistant high

metallic foil, for example, stainless steel foil etc.

[0008]According to the heating process at the time of manufacture of a display, etc., a hillock occurs like aluminum and the smooth nature of a membrane surface falls. A film condenses depending on the construction material and the heated atmosphere of a substrate, and decline in the large reflectance by membranous continuity being lost and increase of resistance are produced. After corrosion resistance originates in a low thing and forms membranes on a substrate, it discolors only by neglecting [about] it to the atmosphere on the 1st, and becomes a reflection property which is tinged with the yellow taste. It was corroded by the drug solution used at the time of manufacture of a display, and there was a problem which causes decline in reflectance and the rise of resistance substantially.

[0009]In order to solve the above-mentioned problem, to JP,9-324264,A, Au 0.1 - 2.5at%, Cu - - 0.3 - 3at% -- the alloy to add on a glue line at JP,11-119664,A at Ag, [Pt and] the alloy and JP,2001-192752,A which add Pd, Au, Cu, and nickel -- Ag -- Pd -- 0.1 - 3wt%, aluminum, Au, Pt, etc. -- 0.1 - 3wt% -- the alloy to add is proposed.

[0010]However, when an element is added by the method indicated by these, low resistance, such as producing the increase in resistance and decline in reflectance, especially the reflectance by the side of the low wavelength of a light region, high reflectance, adhesion, hillock tolerance, and the alloy film with which it can be satisfied of corrosion-resistant and heat-resistant all cannot be obtained. If Pd, Pt, and nickel are added 0.2% or more, reflectance will fall, and if content exceeds 1at% further, specifically, specific resistance will exceed 5microomegacm, for example. When Au and Cu are added, there are few decline in reflectance and increases in resistance, but there is a problem in heat resistance and adhesion.

[0011]the Ag alloy system electronic parts which have electrical resistance with the low purpose of this invention, high reflectance, hillock tolerance, heat resistance, corrosion resistance, and the adhesion to a substrate -- public funds -- it is in providing a group film.

[0012]

[Means for Solving the Problem]By carrying out compound addition of the element chosen as Ag, and considering it as an Ag alloy film, as a result of inquiring wholeheartedly so that this invention persons may solve the above-mentioned technical problem, Corrosion resistance was improved without spoiling greatly high reflectance which Ag originally has, and low electrical resistance, it found out that adhesion to a substrate was also further improvable, and this invention was reached.

[0013]That is, this invention is an Ag alloy film for electronic parts which becomes a 0.1-3at% hidden remainder real target from Ag about one sort or two sorts of elements among Cu and Au 0.1 - 2at% in total in one or more sorts of elements chosen from Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb. under the present circumstances -- choosing Au to Cu and Cu -- Cu -- 0.1 - 2at% --

choosing containing or Cu, and Au to Au -- Au -- 0.1 - 3at% -- containing is preferred.
[0014]Another this invention is a sputtering target material for Ag alloy film formation which becomes a 0.1-3at% hidden remainder real target from Ag about one sort or two sorts of elements among Cu and Au 0.1 - 2at% in total in one or more sorts of elements chosen from Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb. under the present circumstances -- choosing Au to Cu and Cu -- Cu -- 0.1 - 2at% -- it is preferred that choose to contain or Cu, and Au to Au, and Au is included 0.1 to 3 at.
[0015]
[Embodiment of the Invention]The important feature of the Ag alloy film for electronic parts of this invention, One or more sorts of elements chosen from Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb, Among Cu and Au, about one sort or two sorts of elements [a proper quantity of], every, while it compounds, and it contains and this controls the increase in resistance, and a fall and film peeling of reflectance, it is the point of having improved the adhesion over a substrate, and corrosion resistance.
[0016]Below, the Ag alloy film for electronic parts of this invention explains Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb, and in total explains the reason for making content of one sort or two sorts of elements into 0.1 - 3at% in total among Cu and Au further 0.1 - 2at%. First, the corrosion resistance of the Ag alloy film for electronic parts improves by containing Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb. However, less than [0.1at%], there is no corrosion-resistant improvement effect, and on the other hand, content will produce the increase in resistance of what [excellent], and decline in reflectance in corrosion resistance, if 2at% is exceeded. Therefore, the content may be 0.1 - 2at%. It is 0.2 - 1at% preferably.
[0017]Generating of a hillock can be reduced by containing one sort or two sorts of elements, Cu and Au, added simultaneously. However, if total content does not have the depressor effect of a hillock less than [0.1at%] and exceeds 3at% on the other hand, the rise of resistance and the reflectance by the side of the low wavelength of a light region will fall. Therefore, the content may be 0.1 - 3at%. It is containing Cu at 0.1 - 2at% among elements, and containing 0.1 - 3at% for Au independently among Cu and Au, preferably, and it becomes possible to obtain higher reflectance and the low resistance Ag alloy film for electronic parts.
[0018]Maintenance of the low resistance by content of the above-mentioned element group of this invention and reflectance or the reason for improvement is not clear. However, the alloying element of Sc, Y, Eu, Sm, Tb, Dy, Er, and Yb which were selected by this invention tends to form Ag and a compound, controls the intergranular corrosion of Ag by depositing in a grain boundary, and raises a resistance to environment. The melting point is still higher than Ag, by adding Cu easily mixed with Ag, and Au, atomic diffusion can be delayed and generating of a hillock can be controlled. [0019]That is, generating and the condensation of HIRROKU by a deposit of the compound of Ag and Sc in a grain boundary, Y, Sm, Eu, Tb, Dy, Er, and Yb and

the abnormal growth of the grain accompanying [when Cu and Au stagnate in a grain] movement of the atom in a heating process are controlled, and heat resistance improves. Since it becomes a detailed and smooth surface shape from uneven-shape-izing and generating of the void by it being controlled in addition to the ability to control grain growth, the increase in resistance and decline in reflectance can also be controlled. To improve adhesion is considered by the effect that membrane stress is reduced by addition of these elements, and the effect of both condensation control.

[0020]Usually, in the film formed by sputtering etc., the element added dissolves by supersaturation in a matrix. That is, since an alloying element invades between crystalline lattices at supersaturation, the lattice is confused, and since a motion of a free electron is checked, resistance increases. By on the other hand, the thing which the compound of Sc, Y, Sm, Eu, Tb, Dy, Er and Yb which are alloying elements, and Ag does for a grain boundary deposit in the case of this invention. The inside of Ag grain is considered to be the reason resistance also with low becoming an Ag independent or Ag, and the organization where Cu with a near crystalline lattice and Au dissolved, and a motion of a free electron not being checked, either is maintainable.

[0021]As for the Ag alloy film for electronic parts of this invention, in order to obtain the stable resistance and reflectance, it is preferred to be referred to as 50-300 nm as thickness. A membranous surface shape changes easily that it is less than 50 nm, and resistance increases. When it furthermore uses for a plane display device, in order that light may penetrate, reflectance falls. On the other hand, although resistance and reflectance do not change a lot that it is the thickness over 300 nm, while becoming easy to separate by membrane stress, when forming a film, time is taken and productivity falls.

[0022]When forming the Ag alloy film for electronic parts of this invention, sputtering using a target material is the optimal. it is because the film of the presentation can be mostly formed with a target material in sputtering process -- the electronic parts of this invention -- public funds -- it becomes possible to form stably the Ag alloy film which is a group film. For this reason, another this invention is a sputtering target material for Ag alloy film formation which has the same presentation as the Ag alloy film for electronic parts of this invention.

[0023]What is necessary is just to be able to attain a high grade, a uniform organization, high density, etc. which are generally required of a target material, although it is variously about the manufacturing method of a target material. For example, after hardship useful opening adjusts in a predetermined organization, it casts to metal molds, tabular is further processed with a forge, rolling, etc. after that, and it can manufacture by making the target of predetermined shape by machining.

[0024]A thin film can be formed by sputtering and what is necessary is for a resin substrate, a metal substrate, other resin foil, a metallic foil, etc. to be just used although it is preferred to

use a glass substrate and a Si wafer as a substrate used when forming the Ag alloy film for electronic parts of this invention.

[0025]

[Example]The ingot was created with the vacuum melting process so that it might become substantially the same as that of the target system of the Ag alloy film which is a metal membrane for electronic parts, after processing tabular with cold rolling, the target material was produced, and the target material (100 mm in diameter and 5 mm in thickness) was produced by machining. using the target material -- sputtering -- a glass substrate or Si-wafer top -- the electronic parts of 200 nm of thickness -- public funds -- the Ag alloy film which is a group film was formed, and as membrane characteristics, specific resistance used 4 terminal method, reflectance used the optical reflectometer, and it measured.

[0026]the electronic parts which produced [above-mentioned] in order to evaluate change of membrane characteristics after passing through the manufacturing process as predetermined products -- public funds -- the following conditions estimated the Ag alloy film which is a group film. the characteristic after evaluating the specific resistance after performing heat-treatment of 2 hours in the temperature of 250 **, and a nitrogen gas atmosphere as heat-resistant evaluation, and reflectance and neglecting 24h in the atmosphere of the temperature of 80 **, and 90% of humidity as an environment nature evaluation test -- and, the metal membrane which performed the above-mentioned heat-resistant evaluation as a process evaluation examination -- Tokyo -- adaptation -- make OFPR-800 resist being formed with a spin coat, and, Negatives were developed after exposing resist by ultraviolet rays organic alkali developing solution NMD-3 using the photo mask, the resist pattern was produced, and the reflectance of the portion without a resist pattern was measured again. Then, it etched with the mixed liquor of phosphoric acid, nitric acid, and acetic acid, metal membrane wiring was created, the resistance was measured, and it asked for specific resistance.

[0027]In order to evaluate membranous adhesion, Scotchtape was stuck on the surface of the metal membrane which heat-treated, and the area at the time of tearing off in the direction of 45 degrees of slant was expressed with the area rate per 20-cm^2, and was evaluated as adhesion power. The result which more than measured is shown in Table 1 and Table 2.

[0028]

[Table 1]

No.	組成(at%)	成膜時 反射率(%)	成膜時 比抵抗 μΩcm	熱処理後 反射率(%)	熱処理後 比抵抗 μΩcm	環境試験後 反射率 (%)	環境試験後 比抵抗 μΩcm	70℃×5日後 反射率 (%)	70℃×5日後 比抵抗 μΩcm	密着性 (%)	区分
1	Ag	99.5	2.5	70	9.7	86	3	82	10.5	50	比較例
2	Ag- 0.1 Sm- 0.50 Cu	99.1	2.6	93.8	2.7	96.6	3.1	94.3	3.2	80	本発明例
3	Ag- 0.5 Sm- 1.00 Cu	98.5	2.9	96.6	3.1	97.4	3.4	96.8	3.5	80	本発明例
4	Ag- 2.5 Sm- 2.00 Cu	92.8	4.5	92.2	5.3	92.4	5.4	92.3	5.2	85	比較例
5	Ag- 0.5 Dy- 0.30 Cu	98.9	2.9	96.0	3.1	96.6	3.5	96.5	3.5	80	本発明例
6	Ag- 0.3 Dy- 1.00 Cu	98.6	2.7	96.2	2.8	97.4	3.3	96.5	3.4	85	本発明例
7	Ag- 2.0 Dy- 3.00 Cu	94.5	4.4	94.0	4.8	94.2	4.8	94.0	5.0	90	本発明例
8	Ag- 0.2 Er- 0.50 Cu	99.0	2.7	94.8	2.7	96.7	3.2	95.3	3.4	85	本発明例
9	Ag- 2.0 Er- 1.50 Cu	96.3	4.1	95.7	4.7	95.8	4.9	95.8	4.8	90	本発明例
10	Ag- 1.5 Er- 0.45 Cu	98.0	3.7	96.9	4.2	96.9	4.4	97.1	4.4	85	本発明例
11	Ag- 0.5 Er- 3.20 Cu	94.3	3.5	93.4	4.3	93.9	4.2	93.5	4.9	90	比較例
12	Ag- 2.5 Er- 0.20 Cu	94.8	4.5	94.0	5.3	93.9	5.4	94.2	5.2	75	比較例
13	Ag- 1.5 Sc- 1.50 Gd	95.0	4.9	94.4	5.4	94.5	5.9	94.3	5.6	65	比較例
14	Ag- 1.0 Y- 0.30 Tb- 0.2 Cu	97.8	3.4	96.7	3.8	96.7	4.0	96.7	4.2	85	本発明例
15	Ag- 0.2 Dy- 0.20 Er- 1 Cu	98.1	2.7	96.3	2.8	96.4	3.2	96.4	3.4	85	本発明例
16	Ag- 1.1 Yb- 1.00 Er- 1.0 Cu	94.4	3.6	93.7	4.2	93.8	5.5	93.8	5.1	90	比較例
17	Ag- 1.5 Sm- 0.45 Cu- 1.0 Au	97.5	4.0	96.5	4.4	96.6	4.8	96.7	4.7	85	本発明例
18	Ag- 1.5 Pd- 1.50 Cu	94.0	4.0	89.0	4.9	92.0	6.4	88.0	5.6	85	比較例
19	Ag- 1.5 Cu- 1.50 Au	98.5	3.1	84.8	5.5	89.5	5.0	93.0	7.7	80	比較例
20	Ag- 0.5 Cu	99.3	2.6	82.3	5.6	86.4	5.5	94.2	7.2	70	比較例
21	Al- 1.5 Nd	98.5	15.0	92.0	7.0	94.5	16.2	95.4	7.2	80	比較例

[0029]

[Table 2]

No	組成 (at%)	成膜時 反射率 (%)	成膜時 比抵抗 μΩcm	熱処理後 反射率 (%)	熱処理後 比抵抗 μΩcm	環境試験後 反射率 (%)	環境試験後 比抵抗 μΩcm	70℃試験後 反射率 (%)	70℃試験後 比抵抗 μΩcm	密着性 (%)	区分
22	Ag- 0.1 Y- 0.10 Au	99.4	2.6	87.5	2.7	88.4	3.1	90.3	3.3	80	本発明例
23	Ag- 0.3 Y- 0.30 Au	99.1	2.7	95.1	3.0	89.2	3.3	96.1	3.4	80	本発明例
24	Ag- 0.1 Sc- 0.00 Au	99.4	2.6	95.6	2.7	93.0	3.1	93.1	3.3	80	本発明例
25	Ag- 0.2 Sm- 0.30 Au	99.2	2.7	95.6	2.8	94.6	3.2	95.2	3.4	85	本発明例
26	Ag- 0.5 Sm- 2.00 Au	98.8	2.9	97.8	3.3	97.3	3.5	97.4	3.6	90	本発明例
27	Ag- 0.1 Dy- 2.80 Au	99.4	2.6	98.4	2.7	89.2	3.1	96.7	3.3	85	本発明例
28	Ag- 0.2 Dy- 3.00 Au	99.2	2.7	98.4	2.8	97.5	3.2	97.2	3.4	85	本発明例
29	Ag- 0.5 Dy- 2.00 Au	98.8	2.9	97.8	3.3	97.3	3.5	97.4	3.6	85	本発明例
30	Ag- 1.0 Dy- 1.00 Au	98.2	3.3	97.0	4.1	97.0	4.0	97.3	4.0	90	本発明例
31	Ag- 1.5 Dy- 1.00 Au	97.5	3.7	96.6	4.9	96.7	4.4	96.9	4.4	90	本発明例
32	Ag- 2.0 Er- 0.50 Au	96.8	4.1	96.0	5.7	96.2	4.9	96.4	4.8	95	本発明例
33	Ag- 0.5 Er- 0.10 Au	98.8	2.9	89.0	3.3	96.1	3.5	92.2	3.6	85	本発明例
34	Ag- 0.5 Er- 1.00 Au	98.8	2.9	97.2	3.3	96.8	3.5	97.2	3.6	85	本発明例
35	Ag- 0.5 Er- 2.80 Au	98.8	2.9	98.0	3.3	97.5	3.5	97.6	3.6	90	本発明例
36	Ag- 1.5 Er- 0.45 Au	97.5	3.7	96.4	4.9	96.6	4.4	96.9	4.4	90	本発明例
37	Ag- 2.0 Tb- 0.45 Au	96.8	4.1	95.9	5.7	96.2	4.9	96.4	4.8	95	本発明例
38	Ag- 2.5 Tb- 0.50 Au	93.7	4.5	93.0	6.5	93.1	5.4	93.3	5.2	85	比較例
39	Ag- 1.0 Yb- 3.50 Au	94.0	3.3	93.6	4.1	93.5	4.0	93.5	4.0	90	比較例
40	Ag- 3.0 Yb- 0.20 Au	93.9	4.9	93.2	7.3	93.4	5.9	93.5	5.6	90	比較例
41	Ag- 0.3 Sm- 0.50 Eu	98.5	2.7	88.0	3.0	90.8	3.3	90.8	3.4	75	比較例
42	Ag- 0.3 Dy- 0.30 Er- 0.2 Au	96.7	2.7	95.3	3.0	94.5	3.3	94.9	3.4	85	本発明例
43	Ag- 0.2 Sm- 0.20 Cu- 0.4 Au	97.3	2.7	96.0	2.8	94.8	3.2	95.2	3.4	85	本発明例
44	Ag- 0.3 Er- 1.00 Au- 0.5 Cu	97.1	2.7	96.1	3.0	96.1	3.3	96.1	3.4	95	本発明例

[0030]Although a pure Ag film has resistance of 2.5microomegacm, and the reflectance of 99% at the time of membrane formation, when heat treatment and an environmental test are done, resistance is substantially understood that adhesion is low while increasing and reflectance's falling. The specific resistance at the time of membrane formation of an aluminum-Nd alloy is high, and it turns out that reflectance is low. Although the specific resistance after heat treatment falls, the value is as high as 5 or more microomegacm. Sc, Y, Eu, Sm, Tb which are

rare earth elements on the other hand at Ag of this invention, One or more sorts of elements chosen from Dy, Er, and Yb, and the Ag alloy film which contains one sort or two sorts of elements among Cu and Au, Although specific resistance is higher than Ag and reflectance is slightly low at the time of membrane formation, even if specific resistance and reflectance are good and do an environmental test and a process examination after heat treatment rather than an aluminum-Nd alloy, there are little increase in resistance and decline in reflectance, and it turns out that adhesion is improved substantially. It turns out that it is improving, so that the effect has many additions. It becomes clear [the improvement effect] at more than each addition 0.1at%, and sufficient reflectance is maintained even after doing each examination.

[0031]However, even though there is little decline in the reflectance after each examination when the addition increases, the reflectance at the time of membrane formation falls, and the high reflectance of not less than 95% becomes difficult to get. If, as for Sc, Y, Eu, Sm, Tb, Dy, Er, and Yb which are rare earth elements, the sum total exceeds 2at%, the increase in specific resistance and decline in reflectance will become large. If Cu and Au exceed 3%, decline in reflectance will become large, especially Cu has the large decline in reflectance, when 2% is exceeded, and it becomes difficult to obtain the reflectance of not less than 95%.

[0032]In order to obtain the low specific resistance of 3.5 or less microomegacm by being stabilized, Au and 0.2 - 1.0at% of Cu are [Sc, Y, Eu, Sm, Tb, Dy, Er, and Yb in which the content is a rare earth element] desirable 0.2 - 0.5at%.

[0033]

[Effect of the Invention]the electronic parts which have improved low resistance, high reflectance, heat resistance, a resistance to environment, and adhesion with a substrate according to this invention -- public funds -- it is possible to obtain a group film stably. Therefore, it is useful to plane display devices and various thin film devices, such as high definition LCD which needs low resistance, organic electroluminescence, PDP, etc. and reflection type LCD as which the low power consumption used for a Personal Digital Assistant etc. is required, and industrial value is high.

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CLAIMS

[Claim(s)]
[Claim 1]An Ag alloy film for electronic parts becoming a 0.1-3at% hidden remainder real target from Ag about one sort or two sorts of elements among Cu and Au 0.1 - 2at% in total in one or more sorts of elements chosen from Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb.
[Claim 2]choosing Au to Cu and Cu -- Cu -- 0.1 - 2at% -- the containing Ag alloy film for electronic parts according to claim 1.
[Claim 3]choosing Cu and Au to Au -- Au -- 0.1 - 3at% -- the containing Ag alloy film for electronic parts according to claim 1.
[Claim 4]A sputtering target material for Ag alloy film formation becoming a 0.1-3at% hidden remainder real target from Ag about one sort or two sorts of elements among Cu and Au 0.1 - 2at% in total in one or more sorts of elements chosen from Sc, Y, Sm, Eu, Tb, Dy, Er, and Yb.
[Claim 5]choosing Au to Cu and Cu -- Cu -- 0.1 - 2at% -- the containing sputtering target material for Ag alloy film formation according to claim 4.
[Claim 6]The sputtering target material for Ag alloy film formation according to claim 4 by which choosing Cu and Au to Au and Au being included 0.1 to 3 at.

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